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REPORT TO AMDAHL CORPORATION

"ANALYSIS OF THE MARKET FOR IBM SYSTEM 370 MODELS 168 AND 195 AND FUNCTIONAL EQUIVALENTS"

OCTOBER 1975

INPUT
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Suite 1119
Palo Alto, CA 94304

TABLE OF CONTENTS

PAGE

I. MANAGEMENT SUMMARY 1

II. INTRODUCTION
- Scope and Methodology 2

III. MARKET DATA
- 168 Installed Base Will Grow 28% 7
- 168 On-Order Position Peaks in Mid-76 10
- 38% Of On-Orders are Upgrades 10

IV. SYSTEM DATA
- Lease Purchase Ratios Vary Widely with Industry Group 15
- IBM Leases Favor 4 Years 15
- Installation Rate Peaked in 1974 15
- System Characteristics and Trends 18
    - Memory Peaks at 3 Megabytes 18
    - Number of Channels peaks at 7 18
    - Memory and Channels Peak in 2 Combinations 18
    - High Speed Multiply 25
    - Operating Systems in Use 27
    - Planned Changes in Operating Systems 29
    - Memory Size vs. Operating System 31

V. REVIEW 33

VI. APPENDIX 35

TABLE OF EXHIBITS

EXHIBIT NUMBER	TITLE	PAGE NUMBER
1	Interviews related to first half of project.	3
2	Total Interview Program	5
3	Installed Base and On-Order 195s and 168s	8
4	370/168s On Order	11
5	370/168s On Order Installation Date	12
6	Existing IBM Environments for Future Installations	14
7	Installed 168s - How Acquired	16
8	Number of 370/168 Installations By Year	17
9	370/168s Installed and On-Order - Memory Size	19
10	Installed Year and Memory Size 370/168s	20
11	370/168s Installed and On-Order - Number of Channels	21
12	Relationship Between Memory Size and Number of Channels	23
13	Installed Year vs Number of Channels	24
14	Number of 370/168s with High Speed Multiply	26
15	Operating Systems in Use	28
16	Planned Changes in 370/168 Operating Systems	30
17	Memory Size vs Operating Systems	32

APPENDIX

1	Summary of Installed 168s	36
2	Summary of On-Order 168s	38
3	Installed and On-Order Status of All Interviews	39

MANAGEMENT SUMMARY

- There are 20 IBM 370/195s installed in the U.S., forecast to increase to 25
- There are 300 IBM 370/168s installed world-wide, forecast to increase to a peak of 385 by the fourth quarter of 1976.
- Most new prospects already own a 168 or multiple 155/158s.
- Acquisitions overall are equally apportioned among purchases, IBM leases, and third party leases. Different individual industries have different characteristics.
- 87% of surveyed 168 installations have 3 mb memory or more, with the median at 3.8 mb.
- 84% of surveyed 168 installations have 8 channels or less, with the median at 7.3.
- Half the installations have high speed multiply.
- Of those using virtual systems, half use SVS, half use MVS. An equal number use OS/MVT.
- 9 sites, comprising 13 installations, plan to upgrade to MVS.
- There appears to be no relationship between memory size and operating system.
- There may be opportunities to sell Amdahl machines based on software which is application specialized, and/or network oriented, particularly in insurance and retail.
- A buyer attitude study is recommended.

INTRODUCTION

I. Scope and Methodology

This study was conducted in two parts. Part I involved,

a. Obtaining a list of approximately 70% of IBM installations between 370/155 and 370/195, for the purpose of conducting interviews. A listing of 246 sites, comprising 362 installations of 370/165, 168, and 195s was obtained from Computer Intelligence Corporation, San Diego. Another list, including the first 269 installations of 370/155 and 158s was also obtained from CI Corp. Both of these lists are the property of Amdahl, and are deliverable items of this report.

b. Checking the number of systems with other sources was accomplished via data obtained from IDC, via the July 18, 1975 issue of EDP Industry Reports, and with two consultants affiliated with Input, one of whom has occasional access to IBM's semi-annual installation report, and the other is affiliated with a Third Party Leasing company.

c. Telephone interviews were conducted with known, suspected, and potential owners of IBM 370 systems. Half of the originally planned interviews were to be conducted prior to meeting with Amdahl on Monday, October 13, 1975. The required number of interviews, as well as the number completed at that time were as shown in Exhibit I.

EXHIBIT 1
INTERVIEWS RELATED TO FIRST HALF OF PROJECT

50% of Original Contract	Number of Identified Sites (Using CI)	Number Required To Be Interviewed	Number Actually Interviewed
25% of Identified 195 Sites	13	3	3
5% of Identified 370/168 Sites	146	7	8
5% of Identified 370/165 Sites	121	6	6
2½% of Identified 370/158 Sites	559	14	20
2½% of Identified 370/155 Sites	419	10	22
TOTAL	1258	40	57*

* EXTRA interviews were done to accomodate multiple installation sites.

d. An oral report was presented to Amdahl on Monday, October 13, 1975. At that time, Input was authorized to proceed with the second half of the study, with the following modifications and emphasis:

1. No further 195 interviews were required.
2. 25 more 168 interviews were to be performed.
3. 25 more interviews of multiple 155/158/165 sites were to be performed, seeking those with a minimum of 3 installations per site.
4. More information was to be sought on the type of third party lease and the lease period.
5. The release number of the operating system must be picked up.
6. For those changing operating systems, check for planned hardware changes.
7. For those planning 168 installations, check for computers being replaced, up graded, etc.

e. This report comprises the contractual requirement for summarizing the data and analyses resulting from both parts of the study. The numbers of interviews finally completed are shown in Exhibit 2.

EXHIBIT 2

TOTAL INTERVIEW PROGRAM

Model Number	Number of Sites (Per CI)	Number of Sites Interviewed	Percentage of Sites Interviewed
195	13	3	23%
168	146	43	29
165	121	8	5
158	559	42	8
155	419	29	7
TOTAL	1258	103*	8.2%

* Does not total because of multiple installations per site.

f. In addition,11 more sites have been identified, and some data obtained, although incomplete, where 370/168s are believed to be currently installed, or on order. These sites are included in the summaries in the Appendix to this report.

g. All interviews were conducted by telephone, by experienced Input personnel, knowledgable in the computer industry, and having proven capabilities in interviewing and reporting techniques.

III

MARKET DATA

168 INSTALLED BASE WILL GROW 28%

Input estimates the U.S. installed base of 195s is 20 systems in the U.S. and will increase to about 25. The U.S. base of 370/168s is 220 in non-government installations, and 30 more in public and classified federal government installations. Foreign installations account for 50 more, yielding 300 current world wide systems, excluding those in use by IBM itself.

The on-order position of 370/168s is such as to indicate the peak number of installations will be 385, an increase of 28% and that the peak will be reached by the third or fourth quarter of 1976. We anticipate that 50 systems will go into U.S. civilian installations, 10 into federal government installations, and 25 into foreign installations. These data are shown in Exhibit 3.

Of the 240 U.S. non-classified 370/168 installations, this survey has definitely located 79 systems (33%), with a high probability of 10 more. Of the anticipated 55 non-classifed U.S. orders, this survey has located 13 (24%) currently on order, with a possibility of 10 more future orders for a total of 23 (42%).

As a check against accuracy of the forecast, an examination of IDC data (July 75) reveals their total U.S. installed base estimated at 168, compared with our estimate of 240, non-classifed, actually installed in October 75. Considering an estimated installation rate of about 5-10 per month, plus the interview lag time built into the IDC data base, our number looks quite good.

EXHIBIT 3

INSTALLED BASE AND ON-ORDER
195s and 168s

MODEL	INSTALLED			ON ORDER			TOTAL
	U.S.	FOREIGN	&	U.S.	FOREIGN	&	
195	20	5	25	5	-	5	30
168							
Civilian	220	50	270	50	25	75	345
Federal	20	-	70	5	-	5	25
Classified	10	-	10	5	-	5	15
S/T	250	50	300	60	25	85	385

TOTAL 168s

U.S.	310
FOREIGN	75
	385

IDC's worldwide installed plus on-order total (excluding classified) is 311, compared with our 370. For the same reasons as cited above, 370 seems an accurate estimate.

168 ON-ORDER POSITION PEAKS IN MID-76.

This survey has revealed thirteen 370/168s on order, as shown in Exhibit 4. Of these, 3 are to be delivered during the remainder of 1975, four more during the first quarter of 1976, five during the second quarter of 1976, and one in the third quarter of 1976. These data are presented by the graph in Exhibit 5. It is not possible to determine whether the installation rate will peak in the second quarter of 1976, or if plans for these systems are not made more than 9 months in advance. Our expectation is that deliveries from IBM will cease by the end of 76, and that firms are waiting to see what comes next.

38% OF ON-ORDERS ARE UPGRADES

Of the thirteen 370/168s on order, 5 are upgrades of other IBM equipment. One replaces a 155, one a 158, one a 155 and 158, one a pair of 158s, and one, in conjunction with another planned 168 order will replace three 158s plus two Burroughs machines.

Of the 8 which are not replacing other machines, six will go into sites with existing 168s, one will supplement a 158, and one will supplement a 155 and two 158s.

Thus, of the total, 6 are going into existing 168 environments, 3 into existing sites with single, smaller IBMs, and 4 into existing multiple smaller IBM sites.

An examination of the 12 planned and/or possible future 168 orders uncovered by this survey, 2 are going into 168 or 195 environments, 1 into single smaller IBM environments, and 4 into multiple smaller IBM environments, and 5 are/maybe going into undetermined environments. These data are summarized below, and

EXHIBIT 4

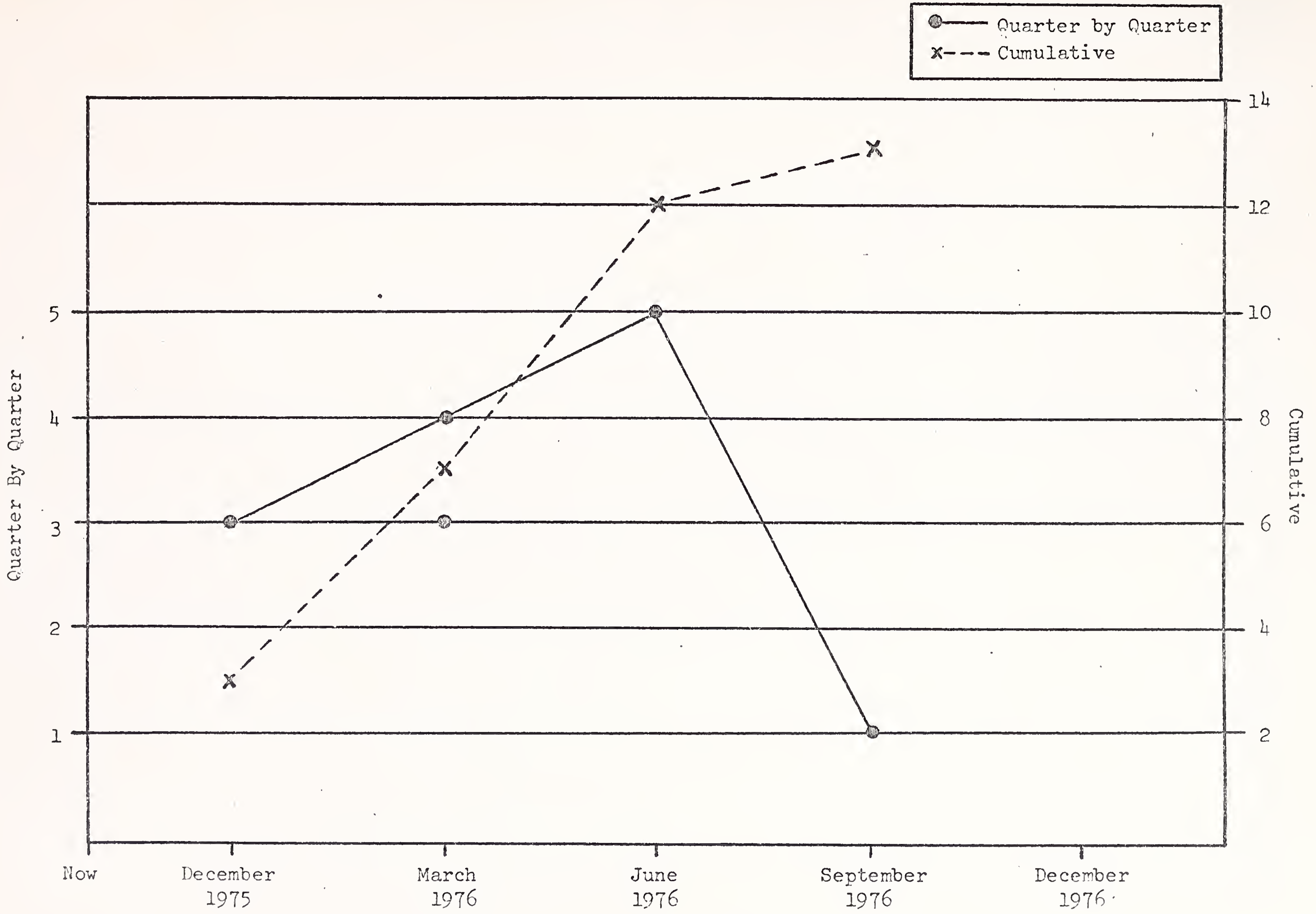
370/168s ON-ORDER

No.	Qty	Site	Memory (Mb)	No. of Channels	Acquire	HSM	OS	When	Replacing
006	1	Rockwell, Bridgeville	3	6	TPL	Yes	MT/MVS	12/75	None
018	1	Deere & Co.	4	7	TPL-3	Yes	VS2 R3.0	3/76	No(also have 3x168)
037	1	Caterpillar, Peoria	3	5	TPL	No	OS/VS	7/76	155 & 158
042	4	HEW-Social Security Baltimore	3	11	P	No	VS2	6/76	None
			3	11	P	No	VS2	6/76	None
			3	11	P	No	VS2	6/76	None
			3	6	P	No	VS2	6/76	None
102	1	Safeco Ins., Wash.	3	5	L-IBM-4	No	MVT R21.8	12/75	None(also have 158)
104	1	GTE, Automatic Electric, Chicago	4	7	TPL	DK	OS/MVT	1/qtr 76	155
107	1	Northeast Utilities, Conn.	4	DK	TPL-5 to 8	No	MVS	1/qtr 76	2x158
108	1	Southern Services, Atlanta	2	5	L-IBM-4	Yes	VS R1.7	1/qtr 76	No(also have 1x155 and 2x158)
109	1	Hartford Insurance	4	8	L-IBM	No	OS R21.6	6/76	Upgrade 1x158
110	1	(Confidential) Bank	1	4	TPL-4	No	MVS	12/75	3x158, 1xB4700, 1xB3500 w/2D 168 planned 9/76
	13		40*	86**	4-P 6-L 3-IBM	3-Yes 9-No 1-DK		3-75 4-1Q76 5-2Q76 1-3Q76	8-No replacement 1-1x155 1-1x158 1-1x155 & 1x158 1-2x158 1-3x158

*Average 3.07
**Average 7.2

EXHIBIT 5

370/168s ON ORDER INSTALLATION DATE
(Units)



suggest that existing 168 sites and existing multiple installation sites (2 or more) are the best targets for 168 or equivalent sales.

EXHIBIT 6

EXISTING IBM ENVIRONMENTS FOR FUTURE INSTALLATIONS

	ON ORDER	POSSIBLE	TOTAL
195	-	1	1
168	6	1	7
Multiple Smaller Systems	4	4	8
Single Smaller Systems	3	1	4
Unknown	0	5	5
TOTAL	13	12	25

IV

SYSTEM DATA

LEASE-PURCHASE RATIOS VARY WIDELY WITH INDUSTRY GROUP

As can be seen in Exhibit 7, the method of acquisition of the 79 identified installed 370/168s is roughly equally apportioned among purchases, IBM leases and third party leases. However, the percentage purchased varies widely with industry groups, from zero for business services, to 71% for banks. Manufacturing and insurance, the two largest users of 168s surveyed, are the least likely to acquire by purchase, and most likely to use third party leasing.

IBM LEASES FAVOR 4 YEARS

Of the 24 IBM leases, 15 were able to identify the period of their lease. Two-thirds of them were 4 years. Nearly all the remainder were 3 years.

On the other hand, third party lessees opt almost uniformly for 3, 5, 7 or 8 year leases, with 4 years - the major IBM lease period - being conspicuously absent.

Business services and banks prefer leases of 5 years or less; the one government lease is for 7 years (HEW spokesmen indicate that all installations are considered to be up for reconsideration every 3 years); manufacturing and insurance are mixed short and long terms.

INSTALLATION RATE PEAKED IN 1974

Of 89 surveyed installed and on-order sites, the greatest number of installations during the period from 1973 to 1976 occured in 1974, as shown in Exhibit 8.

EXHIBIT 7

INSTALLED 168s - HOW ACQUIRED

How Acquired	Mfg.		Banks		Insurance		Gov't.		Business Services		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Purchase	5	19	5	71	8	40	6	43	-	-	3	50	27	34
IBM Lease														
3 years	3		-		1		-		-		-		4	
4 years	3		-		1		2		2		2		10	
5 years	-		-		-		-		-		1		1	
DK*	3		-		-		5		1		-		9	
Sub-Total	9	35	-	-	2	10	7	50	3	50	3	50	24	30
Third Party Lease														
3 years	2		-		2		-		2		-		6	
4 years	-		-		-		-		-		-		-	
5 years	2		2		-		-		1		-		5	
6 years	-		-		1		-		-		-		1	
7 years	-		-		4		1		-		-		5	
8 years	5		-		-		-		-		-		5	
DK*	3		-		3		-		-		-		6	
Sub-Total	12	46	2	29	10	50	1	7	3	50	-	-	28	36
TOTAL	26	100	7	100	20	100	14	100	6	100	6	100	79	100

*DK-Respondent did not know specific answer.

Ⓧ

EXHIBIT 8

– INTERVIEW SAMPLE –

NUMBER OF 370/168 INSTALLATIONS BY YEAR

(Existing and On-order)

YEAR	NUMBER OF INSTALLATIONS		YEAR TO YEAR INCREASE
	Yearly	Cummulative	
1973	21	21	-
1974	38	59	181%
1975	19	78	32%
1976	11	89	14%

SYSTEM CHARACTERISTICS AND TRENDS

Memory Peaks at 3 Megabytes

Out of 79 installed 370/168s, 69 (87.3%) have 3 Mb of memory or more, with the peak at 3 Mb, and the median at 3.76 Mb. Adding in 13 on-order systems yields 87.0% with 3 Mb or more. These data are presented in Exhibit 9.

An examination of current memory size as a function of the year of installation of the computer, as shown in Exhibit 10, suggests a slight increase in memory size the later the year of the original installation. Thus, the trend toward larger memory appears to be a function of larger initial orders in later years, as opposed to upgrading of early installations. The 1976 anomoly may be a result of the limited sample size relative to the other years.

NUMBER OF CHANNELS PEAKS AT 7.

As can be seen in Exhibit 11, the number of channels in installed machines peaks at 7, with 84% having 8 channels or less, whether or not on-order systems are included. Except for 1 order for 3 systems with 11 channels each, for the Social Security Administration, on-order systems surveyed will peak at 5 channels, compared with the installed figure of 7. As with memory, in the preceding section, this anomoly can be due to the sample, or may reflect an unknown (at this time) trend.

MEMORY AND CHANNELS PEAK IN TWO COMBINATIONS

Exhibit 12 shows the relationship between number of channels and memory size for 370/168s surveyed. Here are two prominent

EXHIBIT 9

370/168s INSTALLED + ON ORDER

MEMORY SIZE

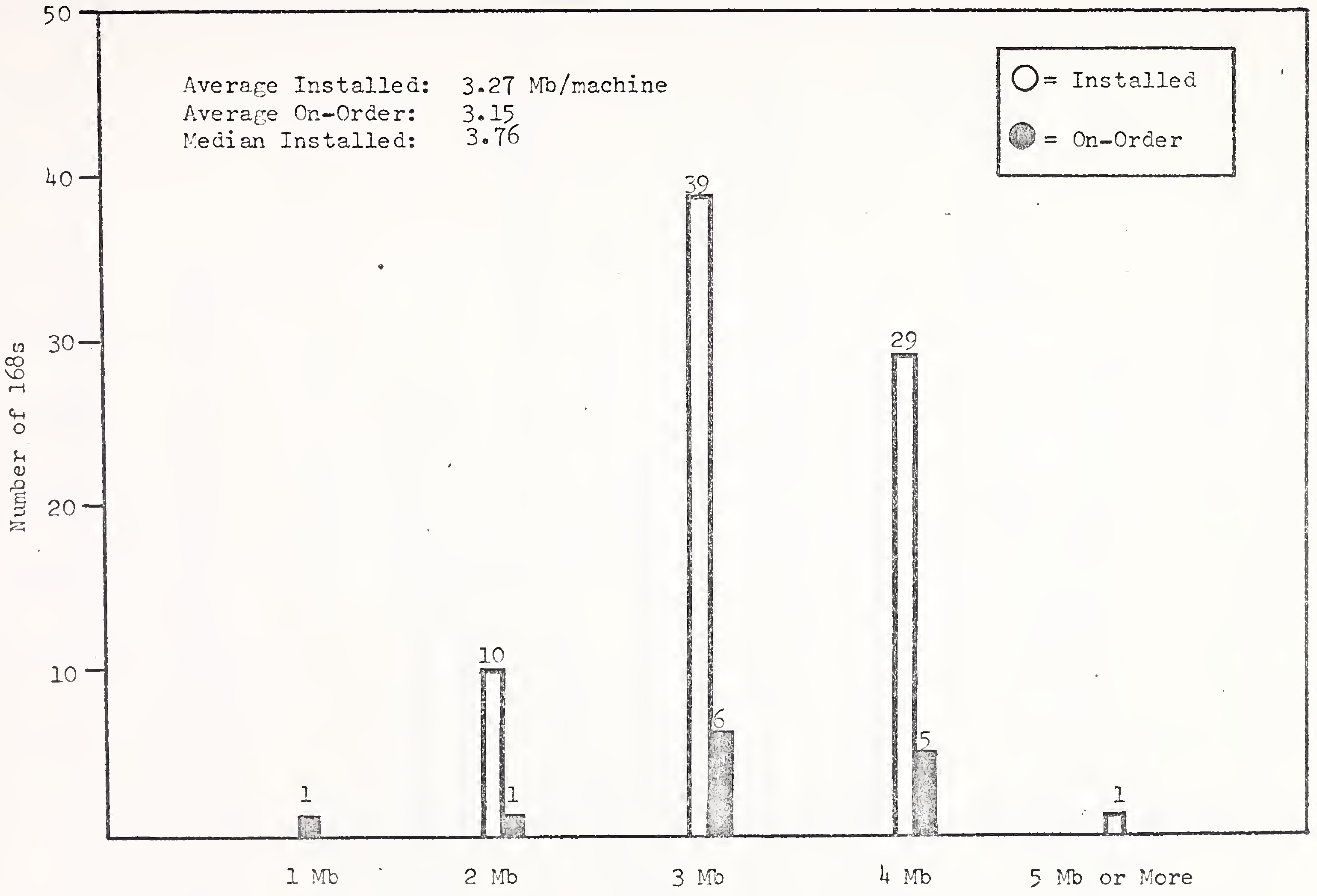


EXHIBIT 10

INSTALLED YEAR + MEMORY SIZE

370/168s

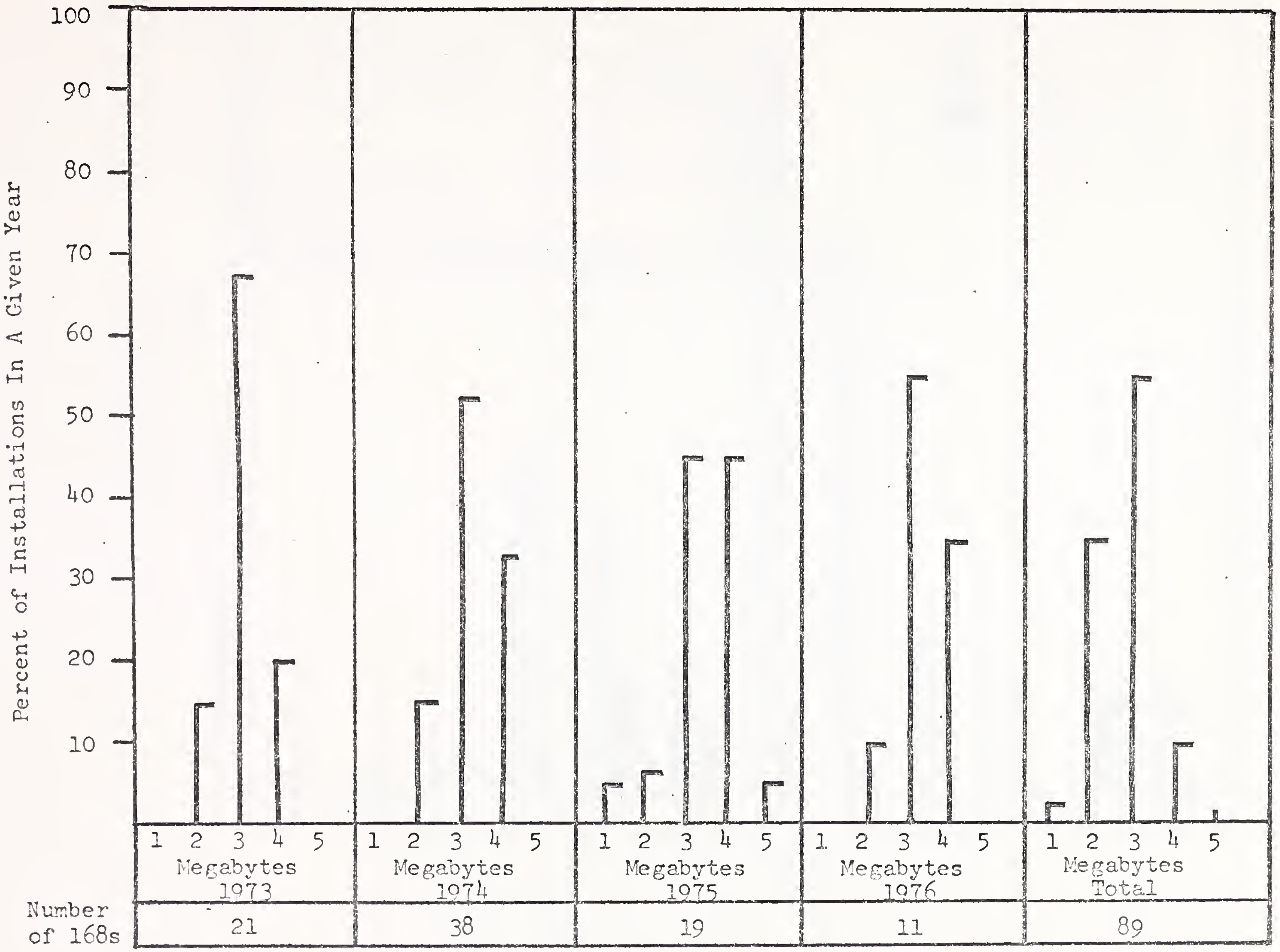
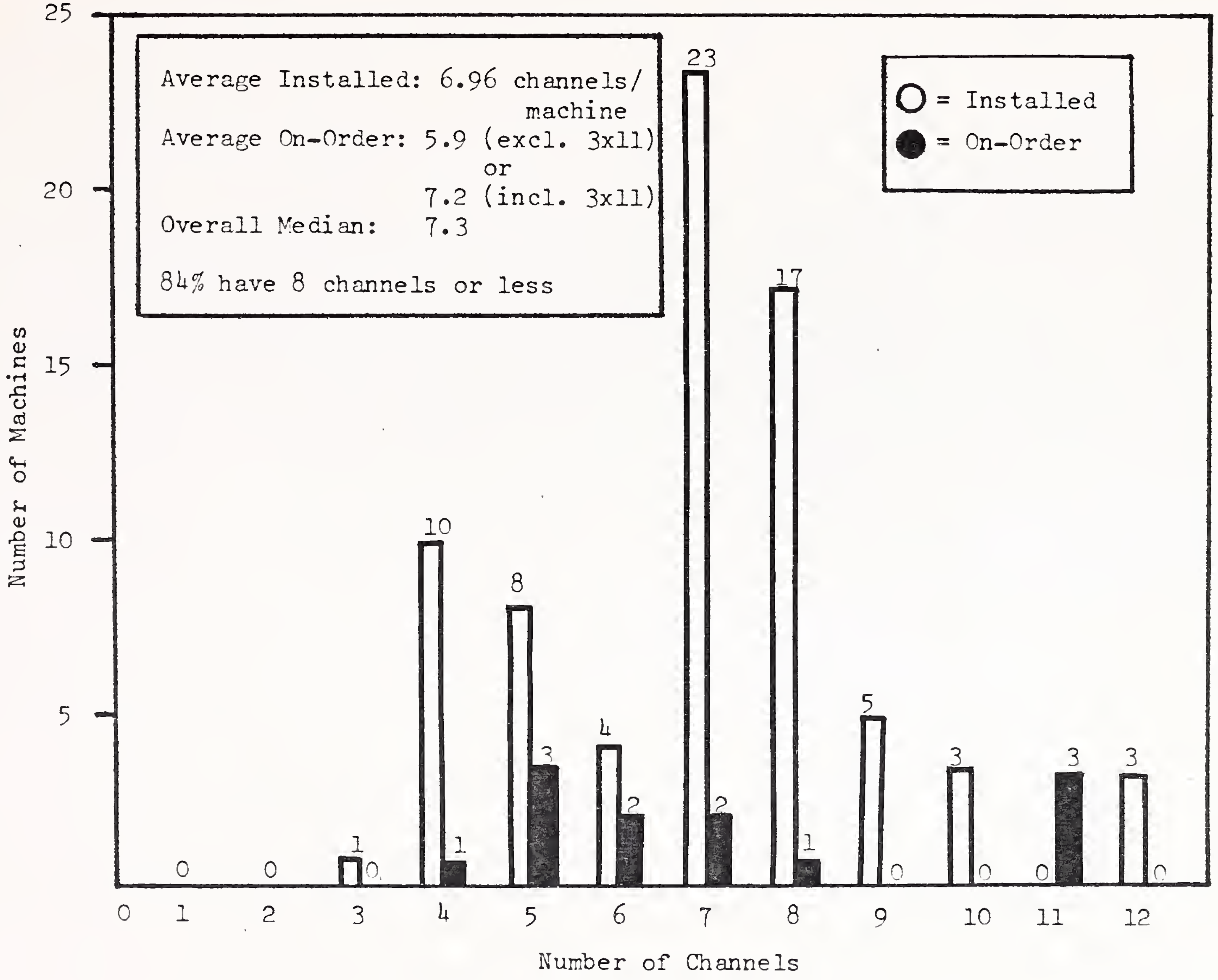


EXHIBIT 11

370/168s INSTALLED AND ON-ORDER

Number of Channels



Average Installed: 6.96 channels/machine

Average On-Order: 5.9 (excl. 3x11)
or
7.2 (incl. 3x11)

Overall Median: 7.3

84% have 8 channels or less

combinations for installed systems:

- 4-5 channels with 2-3 megabytes, and
- 7-8 channels with 3-4 megabytes

On-order systems shown slight peaks at:

- 5 channels with 3 megabytes, and
- 7 channels with 4 megabytes.

An examination of the number of channels per machine versus the year of initial installation yields the results shown in Exhibit 13. The data suggest the possibility that the most popular size is getting smaller, having peaked at 8 in 1974 installations. The near absence of systems with more than 7 channels, among 1973 installations, is curious, and could be important.

EXHIBIT 12

RELATIONSHIP BETWEEN MEMORY SIZE AND NUMBER OF CHANNELS

(Each cell = number of 370/168s in that configuration)

○ = Installed peaks
◌ = On-Order peaks

Mb Memory	Number of Channels											Total
	2	3	4	5	6	7	8	9	10	11	12	
1												0
2		1		4	1		2	2				10
3			8	4	2	14	5	1			3	37
4			2	1	1	9	9	2	3			27
5							1					1
Total	0	1	10	9	4	23	17	5	3	0	3	74

EXHIBIT 13

INSTALLED YEAR VS NUMBER OF CHANNELS

(Number of Systems in Each Cell)

NUMBER OF CHANNELS	INSTALLED YEAR				TOTAL
	1973	1974	1975	1976	
1	-	-	-	-	
2	-	-	-	-	
3	1	-	-	-	1
4	4	5	1	1	11
5	4	1	3	3	11
6	2	2	-	2	6
7	7	8	7	2	24
8	1	11	4	1	17
9	-	5	-	-	5
10	-	3	-	-	3
11	-	-	-	3	3
12	-	1	1	-	2
TOTAL	19	36	16	12	83

High Speed Multiply

The surveyed 370/168 population is nearly equally divided amont those who do, and those who don't have high speed multiply, as shown in Exhibit 14. Virtually no information was available regarding reasons for the choice.

EXHIBIT 14

NUMBER OF 370/168s WITH HIGH SPEED MULTIPLY

	INSTALLED	ON-ORDER	TOTAL	
			#	%
Yes	39	3	42	46
No	34	9	43	47
Don't Know	6	1	7	7
TOTAL	79	13	92	100

Operating Systems in Use

Of 92 surveyed installations, two major groups appeared; those using virtual systems, and those not as shown in Exhibit 15. Of those reporting virtual systems, comprising 48% of the total, half are using SVS, and half are using MVS. The bulk of the remaining installations use OS/MVT and OS 21.7.

EXHIBIT 15

OPERATING SYSTEMS IN USE

NUMBER OF MENTIONS			
	INSTALLED	ON ORDER	TOTAL
SVS	21	1	22
MVS	17	5	22
OS/MVT	19	3	22
OS/21.7	8		8
IMS	1		1
INSUFFICIENT DATA	13	4	17
TOTAL	79	13	92

Planned Changes In Operating Systems

9 sites, comprising 13 installations, reported plans for upgrading to MVS, from a variety of present operating systems, as shown in Exhibit 16. Only 1 user, Rockwell, indicated plans for increasing Memory when the operating system is upgraded.

EXHIBIT 16

PLANNED CHANGES IN 370/168 OPERATING SYSTEMS

NUMBER OF 370/168s	FROM	TO	WHEN
1	VS2 and HASP	MVS	1976
2	SVS	MVS	Evaluating
1	SVS	MVS	July 1976
1	OS/MVT 21.7	MVS	No planned date
1	OS/VS 1.6	VS2 Rel 3.0	6 months
1	MVT 21.7	VS2 Rel 3.6	Testing now
1	OS/VS 1.6	MVS	Planning
1	OS 21.7	VS 3.0	Planning
4	OS 21.7	VS 3.0	Planning

Memory Size vs Operating System

Exhibit 17 shows the operating system in use or on-order for 92 surveyed 370/168s. There does not appear to be any relationship between size of memory, and operating system in use.

EXHIBIT 17

MEMORY SIZE VS OPERATING SYSTEMS

# OF MACHINES IN EACH CELL

(Installed/On-Order)

	MEGABYTES OF MEMORY						
	1	2	3	4	5	SUB TOTALS	TOTALS
SVS		7/1	8/0	6/0		21/1	22
MVS	0/1		9/1	8/3		17/5	22
OS/MVT			10/1	9/2		19/3	22
OTHER OR UNKNOWN		4/0	11/3	6/1	1/0	22/4	26
TOTALS	0/1	11/1	38/5	29/6	1/0	79/13	92

REVIEW

With the number of world wide installations of IBM 370/168 systems expected to increase from a present level of 300 to 385, during the next 12 months, and no IBM successor to the 168 known to be available, the market for a 168 functional equivalent appears exciting. Specific target clients can be identified as current users of 168s, and sites with multiple installations of smaller size IBM systems. The further possibility of selling 168 type systems to EDP service organizations which are not now IBM compatible should be pursued.

In the retail industry, as well as in insurance, there appears to be a wide geographical distribution of EDP centers for any given firm, particularly with systems of the 155 and 158 class. A question to be addressed is, "would such industries convert to larger, more centralized EDP centers, if distributed processing capability were available over networks". If the answer is, "Yes", then Amdahl might consider the possibility of providing network compatible software in order to make significant penetrations into these and other industries. While the insurance industry is a relatively large user of 168s, the use of 155s and 158s in regional offices is even greater. In the retail industry, virtually no 168s are used, but, again, 155s and 158s in various geographic locales are used.

Another possibility to be considered involves the development of a specialized software package which will cause Amdahl

machines to be purchased on the basis of the economy of using that software. A comparable IBM example is the use of Airlines reservations programs, e.g. PARS, on large IBM systems. The airlines are very dissatisfied with IBM, but cannot switch vendors because of the software. A comparable situation may well be possible for some other application, possibly in the financial/insurance community.

We believe that a buyer attitude study of existing and potential 370/168 customers would make a gratifying contribution to Amdahl's future market planning.

APPENDIX

There are three project summaries included in this Appendix.

Exhibit 1 is a two page summary of 79 surveyed 370/168 installations.

Exhibit 2 is a 1 page summary of 13 on-order, 5 probably on-order, and 5 possible orders of 370/168s.

Exhibit 3 is a 4 page summary which identifies installed and on-order positions of all 114 interviews completed or partial.

AMDAHL   INSTALLED 168's - Summary   P1/2   NDS 10/16/75

EXHIBIT 1

Banks & Ins Co in Assets

	Change Planned	On Order	SITE	INDUSTRY	REVENUE $M *	# 168s	Current Memory (MB)	Current # Channels	How Acquired / Term	Install Date	High Speed Mult?	OpSystem	Notes
1	✓		Coca Cola, Atlanta	MFG	2522	1	2	5	P	10 73	Y	VS2 & HASP	MVS in 76; May add 2 MB + 2 Channels
2			Wells Fargo Bank, SF	BANK	* 12675	2	2 ea	9 ea	TPL - 5 yr	74	DK	SVS	Evaluating MVS - No Plans
3			Kemper Insurance, Ill	INS	* 700	1 M3	3	7	P	8 75	No	MVS	Also have 155
4			Standard Oil, Chicago	MFG	?	2	4 ea	DK	L-IBM-4	1 73; 9 74	No	MVT	
5			Marcor, Chicago	RET	4667	1	3	12	L-IBM-4	5 75	No	VS2 - Not MVS	
6	✓		Rockwell, Downey, Ca	MFG	4409	3	4 ea	3×8	TPL-8	12/73; 9/74; 11/74	Y	SVS	May add 168, 175 or Amdahl
			″ , ″	″	″	1	4	1×9	TPL-3	12 74	Y	IMS	MS/VS scheduled for Jan 76
	✓	✓	″ , Bridgeville, Pa	MFG	″	1	4	6	TPL-8	6 74	Y	SVS	MT/MVS July 76; 3MB ×168 on order 12/75
7			State Farm Mutual, Ill	INS	?	2	3 ea	4 ea	P	1/74; 4/74	No	OSMVT ASP3	Many other 145/155/158
8			Latter Day Saints Hosp, Utah	MED	?	1	3	4	L-IBM-5	12 73	Y	OSVS - latest	
9			Mgmt Systems Co, Utah	BUS. SVCS		1	3	7	L-IBM-4	11 73	DK	OSVS2 1.6	
10			Raytheon, Andover, Mass	MFG	1929	1	3	5	P	5 75	No	OSMVT 21.8	
11			State of Illinois	GOVT	?	2 M2	4 ea	8 ea	L-IBM-4	11 74	Y	OSVS2 2.0	
12			Allstate Insurance	INS	?	3	3 ea	8 ea	P	3-3-12 74	Y	OS VS 2.2	
13	✓		Int'l Harvester, Ill	MFG	4966	2	4 ea	7 ea	TPL-5	1-5 74	1×Y 1×No	OSMVT 1×ASP 1×HASP	Adding 1MB on 1 machine within 6 mo
14			Northern Trust, Ill	BANK	?	1	4	4	P	6 75	Y	VS 2.0	
15			McDonnell Douglas, Long Beach	BUS. SVCS	3075	1	4	10	L-IBM-4;	6 74	No	OSMVT 21.7	Will go to MVS in future; No plans
			″			2	4 ea	10 ea	2×TPL-3	3-8 74	No	w/ ASP 3.1	
16			Security Pacific, Glendale, Ca	BANK	* 15487	2	3 ea	4 ea	P	6 73	Y	MVS 2.0	
17			Motorola, Scottsdale	MFG	1367	1	3	6	P	10 73	No	OSVS 1.6	
18	✓	✓	Deere & Co, Ill	MFG	2495	3	4 ea	7 ea	L-IBM-3	9/73 9/73 1/75	YES	VS2 3.0	
19			Computation Center, Ill	EDUC	?	1	2	3	P	8 73	No	OSVS2 1.7 (HASP 2, Version 4.0)	
20			Aetna Life Ins, Hartford	INS	* 9430	1	3	7	L-IBM-3	1 73	YES	OSMVT 21.6	
			″	″	″	2	3 ea	7 ea	TPL: 7 w/4yr option	73	YES	″	
			″	″	″	2	4 ea	7 ea	″	74/75	″	″	
21			Carrier Air Cond, NY	MFG	984	1	3	6	P	9 73	No	VS2 1.6	
22			Grumman Data Syst	BUS. SVCS	1113	1	4	9	L-IBM-?	6 74	YES	VS2 2.2 HASP 3	
23	✓		Chubb & Son	INS	726	1	4	7	TPL-6	2 75	No	OS VS 1.6	In 6 mo. will go to OS/VS2 Rel 3.0
24			Prudential, Newark	INS	7000	2	3	7 ea	P	8/74-10/75	No	OS 21.7 ASP	
25			Travelers, Hartford	INS	?	1	3	8	L-IBM-4	1/75	No	SVS 2.1.7	
			″		?	2	2 ea	8 ea	TPL-3	1 74	No	SVS 2.1.7	Replaced 165s
26			State of Connecticut	GOVT	?	1	3	4	TPL-7	9 74	Y	OS VS2 21.7	
27			General Dynamics, San Diego	MFG	1968	1	4	5	TPL-8	11 73	No	OS VS 21.7	
28			United Aircraft, Conn	MFG	3321	1	3	5	L-IBM-4	9 73	No	OS MVT 21.6	
29			Teale Ctr - State of Calif	GOVT	?	2	3 ea	7 ea	P	6 74	Y	OS VS 1.7	
30			Rohr, Ca	MFG	420	1	4	4	P	6 74	No	VS 2.0	
31			Hellonics (Litton), Ca	BUS. SVCS	3032	1	3	7	TPL-5	10 74	YES	MVT 21.7 - Testing VS2 Rel 3.6 -	Upgrade from 165
32	✓		Lockheed	MFG	3222	1	3	8	TPL-3	1 74	YES	OS MVT - Converting to MVS R 3.0.	Also have 1×165
32						51	186						

AMDAHL INSTALLED 168's Cont'd P2/2 10/75

EXHIBIT I

	Change Planned	On Order	SITE	INDUSTRY	REVENUE	# 168s	Current Memory # MB	Current # Channels		How acquired/ term	Install date	High Speed Multiply?	Op System		Note
33			Continental Ill Bank	BANK	* 15468	2	3ea	7ea	2	P	745 75	NO	VS2		Replaced 2X 155s
34			Time Inc, Chicago	MFG	826	2	3ea	4½ ea	2	L-IBM	12/74-1/75	NO	MVS		
35			Fireman's Fund, SF	INS	?	{ 2	{ 3ea	7ea	2	TPL	73	}			
–						{ 1	{ 4	7	1	TPL	10 75	} YES	VS		
36			Am. Airlines, NYC	TRANS	1641	3	3ea	?	2	1-IBM 4-2P	11/74-4/75-8/75	?			
37			Caterpillar, Peoria, SITE 1	MFG	4082	2	2ea	5ea	2	1 TPL - 1 FGM	12/73 8/74	No	OS VS		Also have 1X 165.
1	✓	✓	SITE 2	MFG		1	2	5	1	TPL	10 75	NO	OS VS		See on-order list.
38	✓		Dept of Agriculture	GOVT		1	3	9	1	P	3 74	Y	OS VS 1.6	Planning	MVS
39			Fed Res Bank	GOVT		1	2	6	1	P	5 74	No	VS2 1.7		
40	✓		HEW - Office of Secy.	GOVT		1	5	8	1	L-IBM	5 75	NO	OS 2 1.7	Planning	VS 3.0
41	✓	✓	HEW - NIH	GOVT		4	4ea	8ea	4	L-IBM	2×8/74; 2×9/75	YES	OS 2 1.7	Planning	VS 3.0
42	✓	✓	HEW - Soc. Security	GOVT		2	3ea	12ea	2	P	1/Q 74	NO	VS2 -	Release unknown	4 168s on order
43			Singer - Wayne, N.J.	MFG		1	3	4	1	TPL	9 73	YES	OS/MVT	HASP	Also have 1X165
						19	258	448							
				Average		1.8/site	3.27M/machine	6.05/machine							

Incomplete Interviews - Probable installations

	SITE	INDUSTRY	# 168s	Note
44	Southern Pacific, SF	TRANS	?	Recently upgraded from 155s
45	Union Oil, Los Angeles	MFG	1	
46	So Cal Edison, Rosemead	UTIL	1	
47	Con Edison, NYC	UTIL	2	
48	Union Carbide, NYC	MFG	1	
51	Occidental Petroleum, Texas	MFG	?	
50	Equitable Life, N.Y.	INS	?	
49	EDS, Camp Hill, SFO			
52	Manufacturer's Nat. Bank, Detroit			
53	Sun Oil Co., Dallas			
54	Xerox, Webster, NY			

AMDAHL ON ORDER 168s

EXHIBIT 2

*Banks & Ins Co ASSETS

	Installed 168 Interviewed #	SITE	Industry	*Revenue $M	# 168s	Planned Memory	Planned #Channels	How Acquire	Planned Install Date	Hi Speed Mult?	OpSystem	Note
101	6	Rockwell, Bridgeville	MFG	4409	1	4	6	TPL	12 75	YES	MTMVS	OpSystem by July 76
102	–	Safeco	INS	* 1241	1	3	5	L-IBM-4	1 76	NO	MVT 21.8 →	Currently have 1x158; Will immediately test MVS 2.3
103	18	John Deere	MFG	2495	1	4	7	L-IBM-3	3 76	Y	VS2 3.0	
104	--	GTE	UTIL/MFG	5662	1	4	7	TPL	1/2 76	DK	OS MVT	Also have 165; 168 will replace 155
105	37	Caterpillar, Peoria, Site 2	MFG	4082	1	3	5	TPL	7 76	NO	OS VS	Replacing 155 and 158
106	42	HEW-SSA	GOVT		4 { 1	3	6	P	6 76	NO	MVS	} also have 2x168 installed
	—				3	3 ea	11 ea	P	6 76	NO	VS2 Release Unknown	
107	–	Northeast Utilities	UTIL		1	4	?	TPL 5-8 yrs	1/2 76	NO	MVS-Latest	Replacing 2 of 3 x 158s
108	–	Southern Services			1	2	5	L-IBM-4	1/2 76	YES	VS 1.7 CICS	Also have 1x158 and 2x155
109	–	Hartford Insurance	INS		1	4	8	L-IBM-8	6 76	NO	OS HASP Rel 21.6	
112	–	CONFIDENTIAL	BANK		1	1	4	+TPL-4	12 75	NO	MVS	Replacing 158s and Burroughs
					13	41	53+(3×11)					
				Average	1.3/site	3.15/median	5.9/7.2					
					PROBABLY ON ORDER							
		Mfrs Nat Bank, Detroit	BANK		2							
		Sun Oil Co, Dallas	MFG		2							
		Xerox, Webster, NY			1							
					5							
						POSSIBLE - BUT NOT ON ORDER						
110		CONFIDENTIAL	BANK		1	1	4	TPL-4	9 76	NO	MVS	Replacing 158s and Burroughs
116		Blue Cross, Oakland	INS		1	4	DK	TPL	MID 76	YES	VS	Would replace 2x158s
112		Trusco Data Systems	BANK		1							Currently have 158 and 145
903		United Airlines	TRANSP		1							
100		Rockwell, Downey	MFG		1							Or 178, or Amdahl
					5							

4913 - Buff
8913 - Green
5913 - White

EXHIBIT 3

HARDWARE REPORT Pg 1/4 JTS 10/17/75

Interview #	SITE		INSTALLED 1 195	2 168	3 165	4 158	5 155	6 Other IBM	ON ORDER, OR (POSSIBLE) 7 195	8 168	9 165	10 158	11 155	12 Other	13 OTHER CHANGES
901	Delta Airlines, Atlanta	2	2												
902	Bank of America (1 in LA; 1 in SF)	2	2												
903	United Airline, Chicago	2	2							(1)					
001	Coca Cola, Atlanta	1.		1					(1)						
2	Wells Fargo Bank, San Fran.	4		2		2									MVS ?
3	Kemper Insurance, Longrove, Ill	2		1			1								
4	Standard Oil, Chicago	2		2											
5	Marcor	2		1	1										
6	Rockwell, Downey and Bridgeville	5		5						1+(1)					MT/MVS
7	State Farm Mutual, Corp, Auto	4		2		1	1								
	Life	2					2								
	Fire	4				2		2×145							
	Fire regions	11				11						14			
	Health	2					2								
8	Latter Day Saints Hospital, Salt Lake City	1		1											
9	Management Systems Co, Salt Lake City	1		1											
10	Raytheon, Andover, Mass	1		1											
11	State of Illinois, Mgmt Info	2		2											
12	Allstate Insurance, Northbrook, Ill	3		3											
13	International Harvester, Hinsdale, Ill	5		2											+1MB
14	Northern Trust Co, Chicago	1		1											
15	McDonnell-Douglas, Long Beach	3		3											MVS
16	Security Pacific Bank, Glendale	2		2											
17	Motorola Govt Electronics, Scottsdale	1		1											
18	John Deere, Moline, Ill	3		3						1					
19	Computation Center, Chicago	1		1											
20	Aetna Life Ins, Hartford	5		5											
21	Carrier Air Cond, Syracuse	1		1											
22	Grumman Data Systems, Bethpage, N.Y.	1		1											
23	Chubb & Son, Short Hills, N.J.	1		1											VS2-5.0
24	Prudential Ins, Newark	2		2											
25	Travelers Ins, Hartford	3		3											
	SUB-TOTALS	19	6	48	1	16	6	2	(1)	2+(2)	-	14	-		

EXHIBIT 3

AMDAHL REPORT

Pg 2/4

JHS 10/17/75

Interview #	interview incomplete	SITE	Σ INSTALLED	INSTALLED and (PROBABLE) 1 195	2 168	3 165	4 158	5 155	6 Other	ON ORDER, OR (POSSIBLE) 7 195	8 168	9 165	10 158	11 155	12 Other	13 OTHER CHARGES
26		State of Connecticut, Hartford	1		1											
27		General Dynamics, San Diego	1		1											
28		United Aircraft, Hartford	1		1											
29		Teale Data Center, Sacramento	2		2											
30		Rohr, Chula Vista, Ca	1		1											
31		Mellonics, Litton, Canoga Park, Ca	1		1											VS 2-3-6
32		Lockheed, Ca, Burbank	2		1	1										
33		Continental Illinois Bank, Chicago	2		2											
34		Time, Inc, Chicago	2		2											
35		Fireman's Fund, San Fran.	3		3											
36		American Airlines, NYC	3		3											
37		Caterpillar Tractor, E. Peoria SITE 1	3		2	1										
		SITE 2	3		1		1	1			1					
38		U.S. Dept of Agriculture	1		1											HJS
39		U.S. Federal Reserve Bank, D.C.	1		1											
40		HEW - Office of Secy	all subject		1											VS5c
41		HEW/NIH	to 3 year		4		2									158 lif[illegible]
42		HEW/Social Security, Baltimore	replacement		2						4					
43		Singer, Wayne NJ	2		1	1										
44	X	Southern Pacific, San Francisco	1		1 (+)											
45	X	Union Oil Co, Los Angeles	1		1											
46	X	So Cal Edison, Rosemead	1		1											
47	X	Con Edison, NYC	5		2	2	1									
48	X	Union Carbide, NYC	4		1	3										
49	X	EDS, Camp Hill and San Francisco														
50	X	Equitable Life	1		1											
51	X	Occidental Petroleum	1		1											
52	X	Manufacturers National Bank, Detroit									(2)					
53	X	Sun Oil Co, Dallas									(2)					
54	X	Xerox, Webster, NY									(1)					
102		Safeco Insurance, Bellevue, Wash.	1				1				1					
104		GTE, Automatic Electric, Chicago?	2			1		1			1					
107		Northeast Utilities, Berlin, Conn	3				3				1					
108		Southern Services, Atlanta, Ga.	3				1	2	116600		1					
109		Hartford Ins, Hartford	4			1	3				1					
110		CONFIDENTIAL	3				3		B4700/B3500		1+(1)					
111		Blue Cross, Oakland, Ca	2				2				(1)					
112		Transco Data Systems, Atlanta	2				1		1x 145		(1)					
		Sub-Total - Previous Page	79	6	48	1	16	6	2	(1)	2+(2)	—	14	—		
		- this Page	72	0	( ) +39	10	19	3	1	0	11+(8)	—	—	—		
		Sub-Total	151	6	( ) +87	11	35	9	3	(1)	13+(10)	—	14	—		

EXHIBIT 3

AUDAIR REPORT

Pg 3/4

DTS 10/17/75

			INSTALLED						ON ORDER OR (POSSIBLE)						
INTERVIEW #	SITE	1 Σ installed	1 195	2 168	3 165	4 158	5 155	6 Other	7 195	8 168	9 165	10 158	11 155	12 Other	13 Other Changes
201	J.C. Penney, NYC	1					1								
2	Woolworths, NYC	1						1×145							
3	United Fruit, Boston	1					1								
4	Memorex, Santa Clara	1					1								
5	Union Oil Research, Brea, Ca	1					1								
6	Hunt-Wesson Foods, Fullerton, Ca	1					1								
7	Mattell Toy, Hawthorne, Ca	1					1								
8	Pacific Mutual Life, Newport Beach	1					1								
9	Teledyne Ryan, San Diego	1					1								
210	Chicago Bridge and Iron	1			1										
11	Home Savings and Loan, N. Hollywood	1				1									
12	So Cal Gas, Monterey Park, Ca	1				1									
13	Auto Club of So Cal	1				1						1			
14	Bank of California, San Francisco	1				1									
15	Western States Bankcard, San Fran.	1				1									
16	Chrysler, Highland Park, Mich	1				1									
17	Black & Decker, Towson, Md.	1				1									
218	Sears Roebuck, Chicago	2				2									
19	A&P - Headquarters	2						2×145							
	Each of 7 regional centers	1×7						7×1×360/22						(7)×(155 or 145)	
220	Kroger Stores - Cincinnati - HQ	2				2									
	13 Regional Center	1×13						{4×115 {9×125							
21	Southern Services, Birmingham	2				2									
22	Connecticut Bank and Trust, Hartford	2				2									
23	Western Electric, Atlanta	4				2	2								
24	Union Trust Co, Darien Conn	2					2								
25	Citizens & Southern Natl Bank	2					2								
26	Varian, Palo Alto	2					2								
27	Montgomery Ward, Ca	2					2								
28	City of Los Angeles, Data Ctr	2					2					(1)			
29	Data Minder, San Diego	2					2								
230	Spiegal, Chicago	2			1		1								
31	San Diego County	2				1		1×145							
32	Santa Clara Cty GSA Ctr	2				2									
33	Anderson Clayton, Phoenix	2				2									
34	City of San Francisco	2				2									
35	Hewlett Packard, Palo Alto	2				2									
36	American Express	2				2									
37	U.S. Fidelity Guarantee Co	2				1		1×145							
38	Western Electric, Sunnyvale	2				2									
239	Polaroid	2				1	1								
	Sub Totals	83	0	0	2	32	24	25	0	0	0	1+(1)		(7)	

EXHIBIT 3

AMDAHL REPORT Pg 4/4 10/17/75

INTERVIEW #	SITE		INSTALLED 1 195	2 168	3 165	4 158	5 155	6 Other IBM	ON ORDER, OR (POSSIBLE) 7 195	8 168	9 165	10 158	11 155	12 Other	13
240	Kraftco, Glenview, Ill	3				3								[illegible]	
241	Safeway Stores, Oakland	3				3									+ memo
242	McDonnell Douglas, Peoria	3				3									
243	TRW Info Services, Long Beach	6				3	3					(3)			(155→15
244	Blue Shield / Blue Cross, Florida	3				2	1			(1)		(1)			(155→15
245	Hospital Service Corp	3				3						(1)			
246	Computer Research, Chicago	3				1		2×360/50							
247	First Natl Bank of Boston	2					2		(1)	(1)					(168 ± 19
248	Alameda Cty DP Center	3					3								
249	American Can Co,	3				2	1								
	Sub-total, this page	32	0	0	0	20	10	2	(1)	(2)	-	(5)	-		
	Sub totals, Pg 1+2	151	6	(1)+87	11	35	9	3	(1)	13+(10)	-	14	-	-	
	Pg 3	83	0	0	2	32	24	25	0	0	0	(1)+1	-	(7)	
114	(11 incomplete) TOTALS	266	6	( )+87	13	87	43	30	(2)	13+(12)	0	14+(6)	-	(7)	